#### (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

#### (19) World Intellectual Property Organization International Bureau



### 

## (43) International Publication Date 24 June 2004 (24.06.2004)

#### PCT

# (10) International Publication Number WO 2004/052541 A1

(51) International Patent Classification<sup>7</sup>: B29C 45/26, 33/00

B01L 3/00,

(21) International Application Number:

PCT/DK2003/000854

(22) International Filing Date:

11 December 2003 (11.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: PA 2002 01901 11

(71) Applicant (for all designated States except US): SCANDI-NAVIAN MICRO BIODEVICES A/S [DK/DK]; Gammelgaardsvej 87 C, DK-3520 Farum (DK).

11 December 2002 (11.12.2002)

(72) Inventors; and

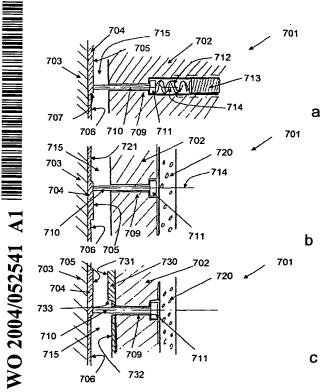
(75) Inventors/Applicants (for US only): HAUPT, Remus [DK/DK]; Krumningen 6, DK-2950 Trørød (DK).

BARHOLM-HANSEN, Claus [DK/DK]; Munkevej 25A, DK-3500 Værløse (DK).

- (74) Agent: LEE, Nicholas; Kilburn & Strode, 20 Red Lion Street, London, WC1R 4PJ (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, SC, SD, SE, SG, SK (utility model), SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: MICRO-FLUIDIC STRUCTURE, METHOD AND APPARATUS FOR ITS PRODUCTION, AND USE THEREOF



(57) Abstract: The present invention relates to a method of producing a micro-fluidic structure element, the method comprising: (a) providing a mould assembly for moulding a micro-structured element; said mould assembly comprising a first and second mould die together forming a die cavity, said first and/or said second mould die comprising: (i) a mould surface, preferably of metal comprising a micro-structured mould surface, and (ii) one or more coin pins extending between said first and second mould die across said cavity, (b) applying a moulding material to consolidate; and (d) ejecting said consolidated moulding material from the die cavity. The invention further provides a micro-fluidic structure obtainable by the method, a mould assembly for moulding a micro-structured element of a micro-fluidic structure, and use thereof. The invention further provides a micro-fluidic structure element, the element comprising a first outer face (101) and a second outer face (108), said first and/or said second outer face comprising at least one micro-structure for at least one micro-fluidic function (103, 109), and said first and said second outer faces being in fluid communication by at least one through-going aperture (107).

WO 2004/052541 A1



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

#### Published:

with international search report



nal Application No PCT/DK 03/00854

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B01L3/00 B29C45/26 B29C33/00

According to International Patent Classification (IPC) or to both national classification and IPC

#### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) IPC 7 B01L B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

FPO-Internal, WPI Data, PAJ

c nocum	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the	he relevant passages	Relevant to claim No
P,X	WO 03 006221 A (POLOSKY QUENTI BIOSCIENCES INC (US)) 23 January 2003 (2003-01-23) the whole document	N F ;ACLARA	1-4, 6-15, 18-23, 25,26, 29-33, 35-42
Ρ,Χ	EP 1 312 456 A (RKT RODINGER K TECHNI) 21 May 2003 (2003-05-2) the whole document	UNSTSTOFF (1)	1-3,5, 11-15, 18-23, 25,26, 29-33, 35-43
X Furti	ner documents are listed in the continuation of box C.	Patent family members are listed i	n annex.
"A" docume consid "E" earlier of filing d "L" docume which is citation "O" docume other n "P" docume	nt which may throw doubts on priority claim(s) or is cited to establish the publication date of another n or other special reason (as specified) ant referring to an oral disclosure, use, exhibition or	"T" later document published after the inte or priority date and not in conflict with cited to understand the principle or the invention  "X" document of particular relevance; the cannot be considered novel or cannot involve an inventive step when the do "Y" document of particular relevance; the cannot be considered to involve an involve a	the application but application but application be considered to comment is taken alone laimed invention reother such docuses to a person skilled
Date of the	actual completion of the international search	Date of mailing of the international sear	ch report
3:	1 March 2004	08/04/2004	
Name and m	nailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2  NL 2280 HV Rijswijk  Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Zattoni, F	





	· · · · · · · · · · · · · · · · · · ·	FC1/DK 03/00004
C.(Continu	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Refevant to claim No.
X Y	WO 00 77509 A (HERGENROEDER ROLAND ;MERCK PATENT GMBH (DE); BENDER RENATE (DE); N) 21 December 2000 (2000-12-21) page 12, line 28 -page 13, line 21; figures 3,4	1-3,6-8, 11-15, 18-42 4,10
X	US 6 126 899 A (WINN-DEEN EMILY S ET AL) 3 October 2000 (2000-10-03) figures 1,4,6-9 column 5, line 43 -column 6, line 63 column 10, line 42 - line 49 column 10, line 60 -column 11, line 13 column 11, line 29 - line 32 column 12, line 47 - line 57 column 14, line 2 - line 34 column 21, line 60 -column 22, line 45	6,11-39, 41,42
X	WO 99 19717 A (SHEA LAURENCE R ;ACLARA BIOSCIENCES INC (US); BJORNSON TORLEIF OVE) 22 April 1999 (1999-04-22) figure 7 page 23, line 27 -page 24, line 21	11-18
A	US 6 321 791 B1 (CHOW CALVIN Y H) 27 November 2001 (2001-11-27) figure 1	11-15
A	US 5 658 413 A (BEK FRITZ ET AL) 19 August 1997 (1997-08-19) figure 7 column 18, line 19 -column 60, line 38	11-15
X	US 2002/100714 A1 (STAATS SAU LAN TANG) 1 August 2002 (2002-08-01) cited in the application figure 1	6,11-18, 24-34
Y	US 4 452 420 A (LUNDQUIST LYNN) 5 June 1984 (1984-06-05) the whole document	4,10
A	US 4 645 443 A (AOKI KATASHI) 24 February 1987 (1987-02-24) column 2, line 64-68	7
	·	
	-	



Interperonal Application No PCT/DK 03/00854

						r C I / DK	03/00854
	atent document d in search report		Publication date		Patent family member(s)		Publication date
WO	03006221	Α	23-01-2003	WO	03006221	A1	23-01-2003
EP	1312456	A	21-05-2003	DE	10156767	A1	28-05-2003
				EP	1312456	A1	21-05-2003
WO	0077509	Α	21-12-2000	DE	19927533	A1	18-01-2001
				AU	5403200		02-01-2001
				AU	5405100		02-01-2001
				MO	0077509		21-12-2000
				WO EP	0077511 1188047		21-12-2000 20-03-2002
				EP	1194769		10-04-2002
•				ĴΡ	2003502637		21-01-2003
				JP	2003502638		21-01-2003
US	6126899	Α	03-10-2000	US	6124138		26-09-2000
				US	2003152994		14-08-2003
				AU	706862		24-06-1999
				AU Ca	2604897 2250212		22-10-1997 09-10-1997
				DE	69700499		14-10-1999
			•	DE	69700499		23-03-2000
				EP	0889751		13-01-1999
				JP	2000508528		11-07-2000
				WO	9736681		09-10-1997
WO	9919717	Α	22-04-1999	AU	1517999		03-05-1999
			·	CA EP	2306126 1032824		22-04-1999 06-09-2000
				JP	2001520377		30-10-2001
				MO	9919717		22-04-1999
US	6321791	B1	27-11-2001	US	6167910		02-01-2001
				US	6648015		18-11-2003
				US	2002023684	A1	28-02-2002
US	5658413	Α	19-08-1997	US	5500071		19-03-1996
		•		EP EP	0734281 0734282		02-10-1996 02-10-1996
				JP	9508706		02-10-1996
				WO	9612545		02-05-1996
				WO	9612546	A1	02-05-1996
				US	6093362		25-07-2000
				US	6264892		24-07-2001
				US US	6635226 6613560		21-10-2003 02-09-2003
				US	6033628		07-03-2000
				US	5882571		16-03-1999
				US	5804022	Α	08-09-1998
				DE			17-10-2002
				DE	69528130		15-05-2003
				EP EP	0708330 0708331		24-04-1996 24-04-1996
				US	RE36350		24-04-1996 26-10-1999
				US	5571410		05-11-1996
				US	5641400		24-06-1997



International Application No PCT/DK 03/00854

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 2002100714	A1		WO US US US	03054488 A1 2003026740 A1 2003111599 A1 2004021068 A1	03-07-2003 06-02-2003 19-06-2003 05-02-2004
US 4452420	Α	05-06-1984	NONE		
US 4645443	A	24-02-1987	JP JP AU CN DE EP KR	62094814 U 61158418 A 581276 B2 5167885 A 85109665 A 3584011 D1 0188000 A2 9202393 B1	17-06-1987 18-07-1986 16-02-1989 03-07-1986 13-08-1986 10-10-1991 23-07-1986 23-03-1992